

What is claimed is:

1. A vibration suppressing cutting tool comprising a holder having a shank formed with a pocket in which a vibration suppressing piece which is not coupled to said holder is received so as not to be able to come of said pocket, wherein at least portions of the inner wall of said pocket that knock against said vibration suppressing piece or portions of the surface of said vibration suppressing piece that knock against said inner wall of said pocket are flat surfaces, whereby said vibration suppressing piece knock against the inner wall of said pocket along surfaces or at a plurality of portions when the holder vibrates during cutting.
2. The vibration suppressing cutting tool of claim 1 wherein said portions of the inner wall of said pocket that knock against said vibration suppressing piece and said portions of the surface of said vibration suppressing piece that knock against said inner wall of said pocket are both flat surfaces.
3. The vibration suppressing cutting tool of claim 1 wherein said pocket has first and second flat inner wall surfaces opposed to each other, and wherein said vibration suppressing piece has third and fourth flat surfaces and is received in said pocket such that said third and fourth surfaces face said first and second surfaces, respectively, with a clearance defined between said first and second surfaces and said vibration suppressing piece, said first, second, third and fourth surfaces being oriented so as to cross the direction in which said holder vibrates during cutting.

4. The vibration suppressing cutting tool of any of claims 1 to 3 wherein said pocket and said vibration suppressing piece have rectangular sections that are perpendicular to a central axis of said shank, said vibration suppressing piece having surfaces configured to abut said pair of opposed inner wall surfaces of said pocket and each having a greater area than other surfaces of said vibration suppressing piece.

5. The vibration suppressing cutting tool of any of claims 1 to 4 wherein between said vibration suppressing piece and said pair of opposed inner wall surfaces of said pocket, a clearance in the range of 0.01 to 0.5 mm is defined.

6. The vibration suppressing cutting tool of any of claims 1 to 5 wherein said pocket has a section perpendicular to a central axis of said shank and having a width  $w$  that is 20 to 100% of the diameter  $D$  or width  $W$  of said shank, and a height  $h$ , which is a distance between said pair of inner wall surfaces, said height  $h$  being 5 to 70% of the height  $H$  of said shank.

7. The vibration suppressing cutting tool of any of claims 1 to 6 wherein said pocket has an axial length  $c$  that is 50 to 250% of the diameter  $D$  or height  $H$  of said shank, and is displaced toward the front end of said tool.

8. The vibration suppressing cutting tool of any of claims 1 to 7 wherein said vibration suppressing piece is made of a material having a

specific gravity that is equal to or greater than the specific gravity of the material forming said shank.

9. The vibration suppressing cutting tool of any of claims 1 to 8 wherein said pair of opposed inner wall surfaces of said pocket extend substantially perpendicular to the direction in which said holder vibrates during cutting.

10. The vibration suppressing cutting tool of any of claims 1 to 9 wherein said vibration suppressing piece comprises a plurality of separate subpieces received in a single pocket or each received in one of a plurality of independent pockets.

11. The vibration suppressing cutting tool of any of claims 1 to 10 wherein said pocket is formed from one side of said holder, said vibration suppressing cutting tool further comprising a piece holding means or sealing means for holding said vibration suppressing piece in said pocket.

12. The vibration suppressing cutting tool of claim 11 wherein said pocket is formed from one side of said holder opposite to the other side of the holder where a cutting edge is located, said pocket being a blind hole that does not reach said other side of said holder.

13. The vibration suppressing cutting tool of any of claims 1 to 12 wherein said holder comprises a shank and a head that is a separate member from said shank, wherein said pocket is open to the front end of said shank, and wherein with said vibration suppressing piece received in

said pocket, the opening of said pocket is closed with said head by joining said head to the front end of said shank.